



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

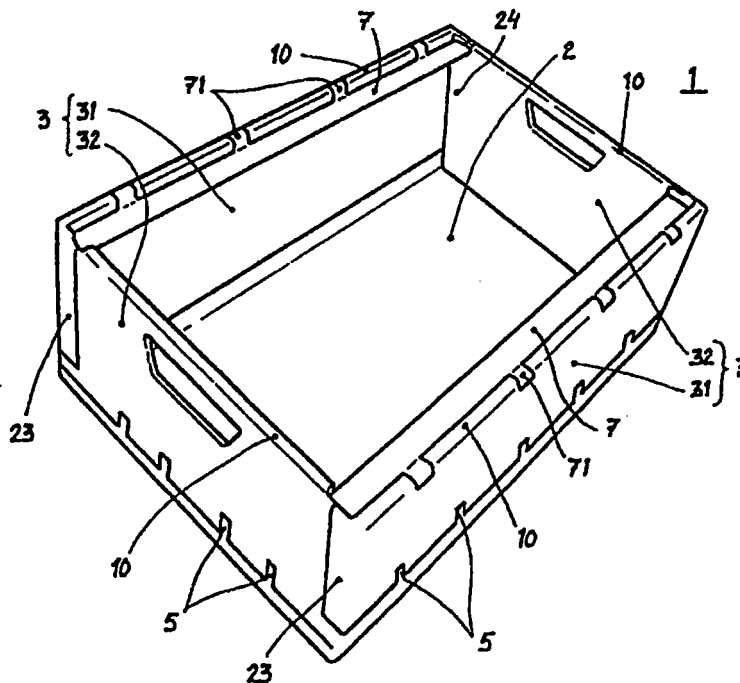
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(74) Agent: STENBERG, Yngve; Perstorp AB, S-284 80 Perstorp (SE).		Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.	

(54) Title: COLLAPSIBLE CONTAINER PROVIDED WITH A STACKING LEDGE

## (57) Abstract

Collapsible container

(1) provided with a base (2) and four side walls (3) which side walls (3) separated into two long side walls (31) and two short side walls (32). The short side and long side walls (31 and 32 respectively) are attached to the base (2) via hinge members (5) at the lower end of each side wall (3). Each side wall (3) is provided with an upper edge (10). The long side walls and short side walls (31 and 32 respectively) are provided with outer edges (23 and 24 respectively) which outer edges (23 and 24 respectively) are provided with coupling members (6) intended for guiding and possibly locking adjacent side walls (3) to each other in an erected position. At least two of the side walls (3), preferably the long side walls (31), are provided with flap members (7) arranged at the upper edge (10) of the two opposing side walls (3). The flap members (7) are moveably attached to the upper edge (10) via hinges (71) and may be swung between an outwards position and an inwards position. The flap members (7) act as a reinforcing means for the side wall (3) and a stacking ledge for containers stacked on top of the collapsible container (1) when in the inwards position.



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## COLLAPSIBLE CONTAINER PROVIDED WITH A STACKING LEDGE

The present invention relates to a collapsible container provided with a base, four foldable side walls and two or more flap members attached to at least two opposite side walls.

Containers made from different materials such as wood, metal, plastic etc. are frequently used. One problem with such containers are that they often demand the same transport volume when returned to the source as when delivered with goods.

An alternative to the return transport is a so-called one way package which is disposed of after delivery.

Another common way to solve the problem is to provide the package with a so-called nesting function. This means that empty containers are partly placed in one another, by providing the containers with sloping sides.

Yet another way to solve the problem is to dismantle or fold the sides of the container. The mostly known side dismantling is the pallet and pallet collar. An example of commonly used containers with foldable sides is the collapsible pallet container. The sides are here made foldable by attaching their respective lower end to the bottom part via a hinge.

A disadvantage with this type of container is that the load carrying ability is radically impaired when compared to solid, non-collapsible containers. This is mainly due to the fact that the corner parts, on non-collapsible containers taking up around 80% of the weight from above, are parted on collapsible containers. Since these load carrying corners are parted on collapsible containers, this will have to be compensated for by adding reinforcing ribs on the sides. This will, besides added weight, also cause difficulties when cleaning the container due to the number of small pockets that are formed between the ribs.

One way to solve the above mentioned drawbacks has been shown in WO 97/39954 where the side walls are provided with a hollow reinforcing profile along three sides of the container. This allows a design with smooth side walls where the normal multitude of reinforcing ribs may be omitted without jeopardising the mechanical stability of the container.

There is however a need to make a folded container even lower than the ones known today. This can be obtained by making the reinforcing side wall profiles thinner. Some of the desired mechanical stability would however be lost.

According to the present invention a collapsible container, where the above mentioned disadvantages are avoided, is obtained. The invention relates to a collapsible container provided with a base, four side walls which are separated into two long side walls and two short side walls. The short side and long side walls are attached to the base via hinge members at the lower end of each side wall. Each side wall is provided with an upper edge. The long side walls and short side walls are provided with outer edges which outer edges are provided with coupling members intended for guiding and possibly locking adjacent side walls to each other in an erected position. The invention is characterised in that at least two of the side walls, preferably the long side walls, are provided with flap members arranged at the upper edge of the two opposing side walls. The flap members are moveably attached to the upper edge via hinges and may be swung between an outwards position and an inwards position in which inwards position the flap members act as a reinforcing means for the side wall and a stacking ledge for containers stacked on top of the collapsible container. The stacking ledge does further make it possible for a container according to the invention to be stacked together with other types of containers such as nestable containers. The flap members are hereby suitably provided with protrusions or recesses intended for the guiding of the base surface of the containers to be stacked on top of the container according to the invention.

According to one embodiment of the invention the flap members are provided with ends, at which ends flap locking means are arranged. The flap locking means are intended to engage edge locking means arranged at the edge of an adjacent side wall whereby adjacent side walls may be securely fixated to each other.

The hinges of the flap member are preferably in the form of loop-shaped snap assembly hinges. The hinges are evenly distributed over the entire length of the side wall it is attached to, whereby the number of hinges on each flap member is at

least three. The flap member will hereby act as a reinforcing means and will add the mechanical strength in the side wall.

According to one embodiment of the invention the hinges of the flap member are in the form of loop-shaped snap assembly hinges. The hinges are evenly distributed over the entire length of the side wall it is attached to. The distance between each hinge does not exceed 75 % of the length of the upper edge of the side wall.

According to another embodiment of the invention the hinges of the flap members are in the form of loop-shaped snap assembly hinges, which hinges have a length exceeding 50% of the length of the upper edge of the side wall.

The upper edge of the side wall, on which a flap member is to be assembled, is preferably provided with a pivot axle intended to interact with the hinges of the flap member.

The flap member is preferably stowed on the outside of the collapsible container when not in use, whereby the storage space on the inside of the container becomes easier to access during emptying and filling of the container.

According to yet another embodiment of the invention, the collapsible container is adapted to receive deviating containers of a design having a smaller base area than the container according to the present application. Such deviating containers may for example be so-called stack nest containers which are nestable by being provided with sloping sides which will give the container a so-called footprint which is much smaller than the area at the upper rim of the same container. This will cause a problem since the load transferred from such a container will be applied at some distance from the load carrying corners of the collapsible container according to the present invention when a nestable container is placed on top of this. The container according to the present invention is preferably provided with a V-shaped load collector connected to the upper edge. The V-shaped load collector is preferably placed close to the point where the outer edge of the footprint of the deviating container will be located. The upper edge is preferably constituted by a hollow profile achieved through injection moulding. The hollow profile suitably stretches along the two short sides and the upper edge of the side walls. Some of the pivot

axes of the hinge are suitably placed so that the V-shaped load collector is used as a bypass for the hollow profile. The lower edge of the V-shaped load collector is preferably connected to a vertical profile which transfers the load to the lower side of the container.

The invention is explained further together with enclosed drawings showing one embodiment of the invention whereby,

-figure 1 shows, in perspective view seen from above, one embodiment of a collapsible container 1 according to the invention.

-figure 2 shows, in perspective view seen from the inside, a corner section of the same embodiment of a collapsible container 1 shown in figure 1.

-figure 3 shows, in perspective view seen from the inside, a corner section of the same embodiment of a collapsible container 1 shown in figure 1 and 2. Some parts of the container have been removed in order to facilitate the understanding of the invention.

-figure 4 shows, schematically seen from one long side, an alternative embodiment of a collapsible container 1 according to the invention where the container 1 is adapted to receive deviating containers 1'.

Figures 1 - 3 show a collapsible container 1 provided with a base 2 (fig. 1) and four side walls 3 (fig. 1). The side walls 3 are separated into two long side walls 31 and two short side walls 32. The short side and long side walls 31 and 32 respectively are attached to the base 2 via hinge members 5 (fig. 1) at the lower end of each side wall 3. Each side wall 3 is provided with an upper edge 10. The long side walls and short side walls 31 and 32 respectively are provided with outer edges 23 and 24 respectively which outer edges 23 and 24 respectively are provided with coupling members 6 (fig. 2 and 3) intended for guiding and locking adjacent side walls 3 to each other in an erected position. The long side walls 31 are provided with flap members 7 at the upper edge 10 of the two opposing long side walls 31. The flap

members 7 are moveably attached to the upper edge 10 via hinges 71 may be swung between an outwards position and an inwards position in which inwards position the flap members 7 act as a reinforcing means for the side wall and a stacking ledge for containers stacked on top of the collapsible container 1. The flap members 7 are provided with ends 72 (fig. 2 and 3) at which ends 72 flap locking means 73 (fig. 3) are arranged. The flap locking means 73 are intended to engage edge locking means 8 (fig. 3) arranged at the edge 10 of an adjacent side wall 3 whereby adjacent side walls 3 is securely fixated to each other when the flap members 7 are in the inner position.

The hinges 71 of the flap member 7 are in the form of loop-shaped snap assembly hinges, which hinges 71 are evenly distributed over the entire length of the side wall 3 it is attached to. The number of hinges 71 on each flap member 7 is four.

The upper edge 10 of the side wall 3, on which a flap member 7 is assembled is provided with a pivot axle 11 (fig. 3) intended to interact with the hinges 71 of the flap member 7.

The flap member 7 stowed on the outside of the collapsible container 1 when not in use, whereby the storage space on the inside of the container becomes easier to access during emptying and filling of the container.

Figure 4 shows, schematically seen from one long side, an alternative embodiment of a collapsible container 1 according to the invention where the container 1 is adapted to receive deviating containers 1'. The collapsible container 1 provided with a base 2 (fig. 1) and four side walls 3 (fig. 1). The side walls 3 are separated into two long side walls 31 and two short side walls 32 (fig. 1). The short side and long side walls 31 and 32 respectively are attached to the base 2 via hinge members 5 at the lower end of each side wall 3. Each side wall 3 is provided with an upper edge 10. The long side walls 31 are provided with flap members 7 (fig. 1) at the upper edge 10 of the two opposing long side walls 31. The flap members 7 are moveably attached to the upper edge 10 via hinges 71 may be swung between an outwards position and an inwards position in which inwards position the flap members 7 act as a reinforcing means for the side wall and a stacking ledge for containers stacked on top of the collapsible container 1. The number of hinges 71

on each flap member 7 is four.

The upper edge 10 of the side wall 3, on which a flap member 7 is assembled is provided with a pivot axle 11 (fig. 3) intended to interact with the hinges 71 of the flap member 7.

The collapsible container 1 is adapted to receive deviating containers 1' of a design having a smaller base area than the collapsible container 1. Such deviating containers 1' may for example be so-called stack nest containers which are nestable by being provided with sloping sides which will give the container a so-called footprint which is much smaller than the area at the upper rim of the same container. This will cause a problem since the load transferred from such a container will be applied at some distance from the load carrying corners of the collapsible container 1 when a nestable container is placed on top of this. The collapsible container 1 is provided with V-shaped load collectors 12 connected to the upper edge 10. The V-shaped load collectors are placed close to the point where the outer edge of the footprint of the deviating container 1' is located. The upper edge 10 is preferably constituted by a hollow profile achieved through injection moulding. The hollow profile suitably stretches along the two short sides and the upper edge 10 of the side walls 31. Some of the pivot axles 11 (fig. 3) of the hinge are suitably placed so that the V-shaped load collector 12 is used as a bypass for the hollow profile. The lower edge of the V-shaped load collector 12 is connected to a vertical profile 13 which transfers the load to the lower side of the collapsible container 1.

The invention is not limited to the embodiments shown since it can be varied in different ways within the scope of the invention.



**Claims**

1. Collapsible container (1) provided with a base (2) and four side walls (3) which side walls (3) separated into two long side walls (31) and two short side walls (32), which short side and long side walls (31 and 32 respectively) are attached to the base (2) via hinge members (5) at the lower end of each side wall (3), that each side wall (3) is provided with an upper edge (10) and that the long side walls and short side walls (31 and 32 respectively) are provided with outer edges (23 and 24 respectively) which outer edges (23 and 24 respectively) are provided with coupling members (6) intended for guiding and possibly locking adjacent side walls (3) to each other in an erected position, c h a r a c t e r i s e d in that at least two of the side walls (3), preferably the long side walls (31), are provided with flap members (7) arranged at the upper edge (10) of the two opposing side walls (3), that the flap members (7) are moveably attached to the upper edge (10) via hinges (71) and may be swung between an outwards position and an inwards position in which inwards position the flap members (7) act as a reinforcing means for the side wall (3) and a stacking ledge for containers stacked on top of the collapsible container (1).
2. Collapsible container (1) according to claim 1, c h a r a c t e r i s e d in that the flap members (7) are provided with ends (72) at which ends (72) flap locking means (73) are arranged, which flap locking means (73) are intended to engage edge locking means (8) arranged at the edge (10) of an adjacent side wall (3) whereby adjacent side walls (3) may be securely fixated to each other.
3. Collapsible container (1) according to claim 1 or 2, c h a r a c t e r i s e d in that the hinges (71) of the flap member (7) are in the form of loop-shaped snap assembly hinges, which hinges (71) are evenly distributed over the entire length of the side wall (3) it is attached to, whereby the number of hinges (71) on each flap member (7) is at least three.

4. Collapsible container (1) according to claim 1 or 2, characterised in that the hinges (71) of the flap member (7) are in the form of loop-shaped snap assembly hinges, which hinges (71) are evenly distributed over the entire length of the side wall (3) it is attached to, and that the distance between each hinge (7) does not exceed 75 % of the length of the upper edge (10) of the side wall (3).
5. Collapsible container (1) according to claim 1 or 2, characterised in that the hinges (71) of the flap members (7) are in the form of loop-shaped snap assembly hinges, which hinges (71) have a length exceeding 50% of the length of the upper edge (10) of the side wall (3).
6. Collapsible container (1) according to any of the claims 3 - 5, characterised in that the upper edge (10) of the side wall (3) on which a flap member (7) is to be assembled is provided with a pivot axle (11) intended to interact with the hinges (71) of the flap member (7).
7. Collapsible container (1) according to any of the claims 1 - 6, characterised in that the flap member (7) is stowed on the outside of the collapsible container (1) when not in use, whereby the storage space on the inside of the container becomes easier to access during emptying and filling of the container.
8. Collapsible container (1) according to any of claims 1 - 7, characterised in that the collapsible container (1) is adapted to receive deviating containers (1') having a comparatively smaller base area, by being provided with a V-shaped load collector (12) connected to the upper edge (10).
9. Collapsible container (1) according to claim 8, characterised in that the V-shaped load collector (12) is placed close to the point where the outer edge of the footprint of the deviating container (1') will be located.

10. Collapsible container (1) according to claim 8 or 9, c h a r a c t e r i s e d in that the upper edge (10) is constituted by a hollow profile achieved through injection moulding, which hollow profile stretches along the two short sides and the upper edge of the side walls (31 and 32 respectively).
11. Collapsible container (1) according to claim 10, c h a r a c t e r i s e d in that the pivot axles (11) placed closest to the outer edge of the footprint are placed so that the V-shaped load collector (12) is used as a bypass for the hollow profile.
12. Collapsible container (1) according to any of the claims 8 - 12, c h a r a c t e r i s e d in that the lower edge of the V-shaped load collector (12) is connected to a vertical profile (13) which transfers the load to the lower side of the collapsible container (1).

Fig. 1

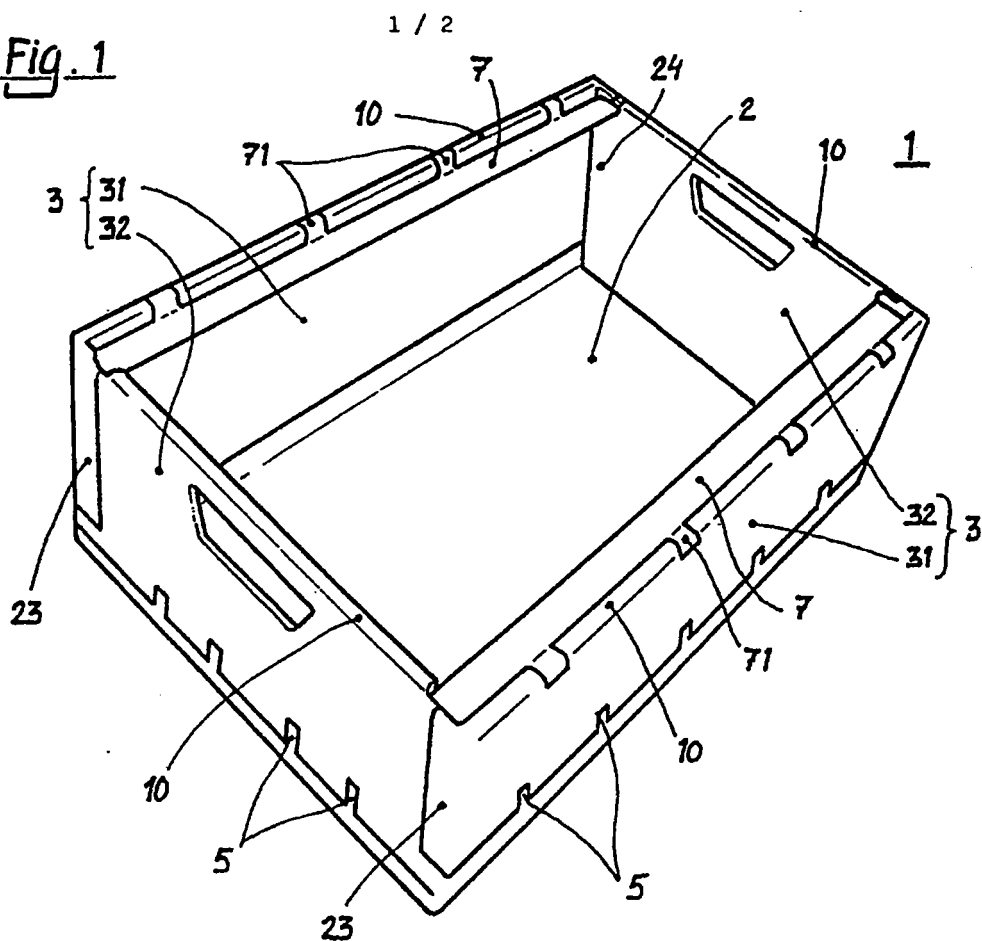


Fig. 2

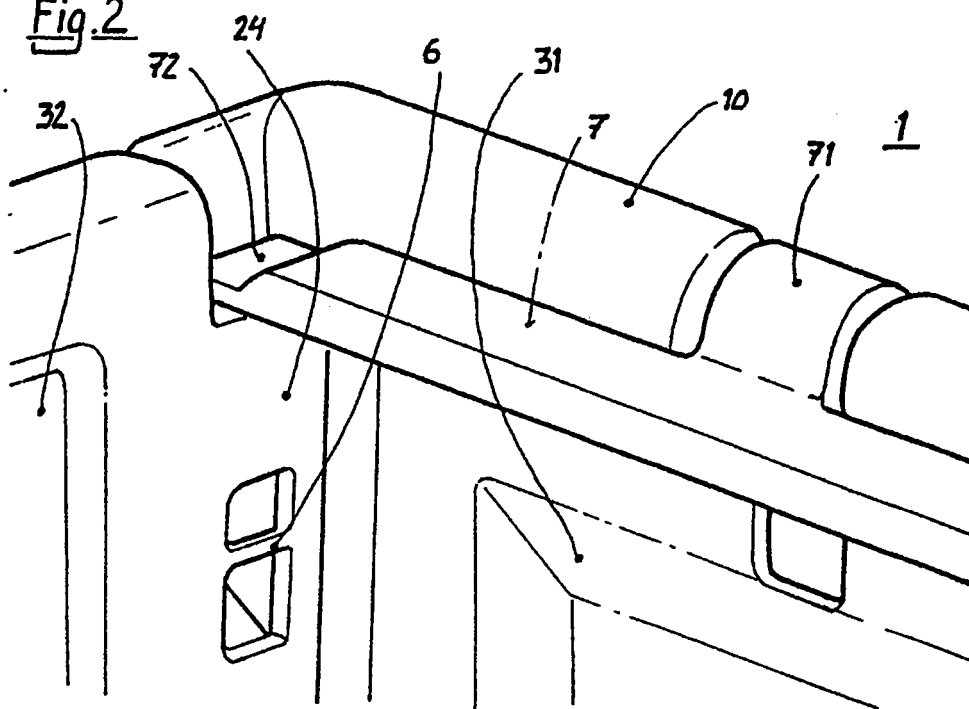


Fig. 3

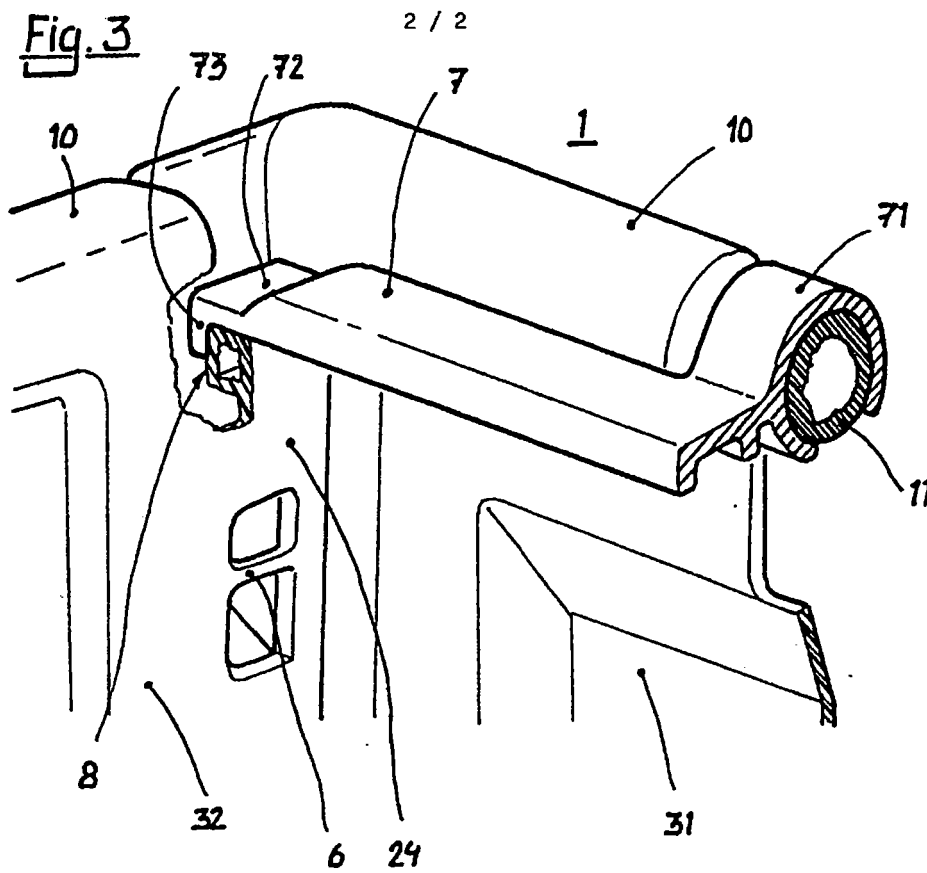
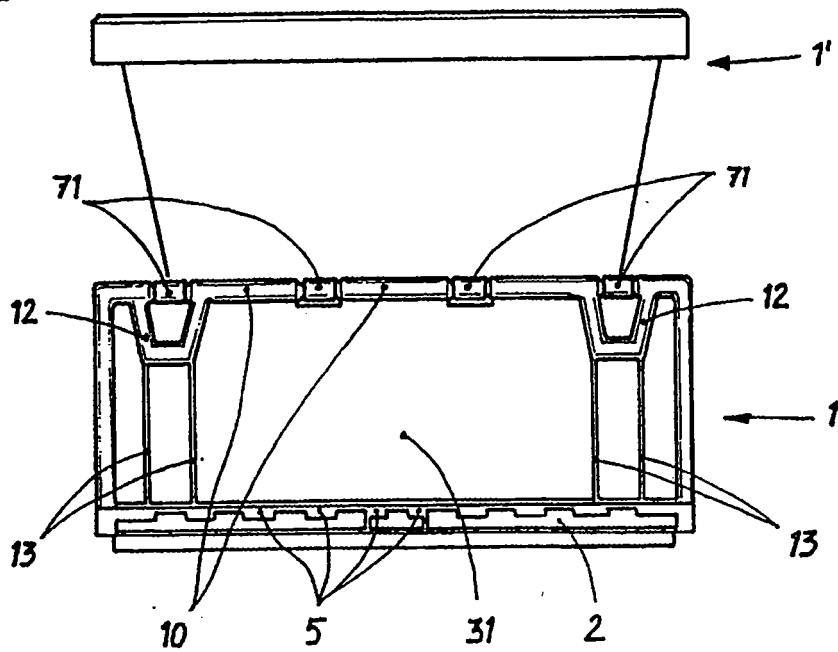


Fig. 4



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 00/00728

## A. CLASSIFICATION OF SUBJECT MATTER

IPC7: B65D 6/18, B65D 21/06

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 9856668 A1 (MCKECHNIE UK LIMITED), 17 December 1998 (17.12.98), page 8, line 1 - line 21, figures 4a-4c,7, abstract	1,2,7
Y	--	3-6,8-12
Y	EP 0505585 A1 (SELTZ, PETER), 30 Sept 1992 (30.09.92), figures 4-7	3-6
A	GB 2068338 A (MR PIERRE DE LAROSIERE DE CHANPFEU), 12 August 1981 (12.08.81)	1-7

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

\* Special categories of cited documents:

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"T" later documents published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"Z" document member of the same patent family

Date of the actual completion of the international search

28 Sept 2000

Date of mailing of the international search report

02 -10- 2000

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/SE 00/00728

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2149757 A (BUCKHORN MATERIAL HANDLING GROUP INC.), 19 June 1985 (19.06.85) --	3-6
A	US 3982650 A (SHIGEO ICHIHARA), 28 Sept 1976 (28.09.76) --	3-6
Y	EP 0655391 A2 (GENERAL ELECTRIC COMPANY), 31 May 1995 (31.05.95), column 7, line 48 - column 8, line 26 --	8-12
Y	US 4674647 A (ANDREW GYENGE ET AL), 23 June 1987 (23.06.87), column 2, line 9 - line 13; column 3, line 50 - line 68 -- -----	8-12

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/SE00/00728

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a):

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see next page

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☒ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.



**INTERNATIONAL SEARCH REPORT**

International application No.  
**PCT/SE00/00728**

- a) Claims 1-7
- b) Claims 8-12

This application contains the following inventions or group of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1.

- a) Claims 1-7: a collapsible container provided with flap members at the upper side of the walls. The flap members are to lock the walls in the raised condition.
- b) Claims 8-12: a collapsible container provided with load collectors.

In the light of WO, 9856668, A1 the subject matter of claim 1 lacks an inventive step.

Since the collapsible container represented by claim 1 lacks inventive step and technical relationship can not be found involving corresponding special technical features, under Rule 13.2, between the subject-matter of claims 1-12 i.e. inventions a) to b), these inventions are not linked together by a single common inventive concept.

Consequently, the dependent claims represent two different inventions, a) to b).

Thus, the International Search Authority considers that there are two inventions in the claims.

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

01/08/00

International application No.

PCT/SE 00/00728

Patent document cited in search report			Publication date	Patent family member(s)		Publication date
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SE	210889	A	07/02/67	NONE		
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